

Mathematical Overview

In this chapter you will extend what you have already learned about some of the more familiar functions in algebra, as well as some you may not yet have encountered. These functions are

- Linear
- Quadratic
- Power
- Exponential
- Logarithmic
- Logistic

You will study these functions in four ways.

ALGEBRAICALLY

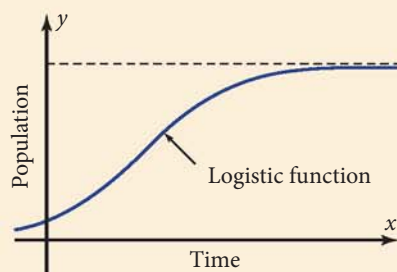
You can define each of these functions algebraically; for example, the logarithmic function is defined

$$y = \log_b x \quad \text{if and only if} \quad b^y = x$$

NUMERICALLY

You can find interesting numerical relationships between the values of variables x and y . Exponential functions exhibit the add-multiply property: As a result of adding a constant to x , the corresponding y -value is multiplied by a constant.

GRAPHICALLY



VERBALLY

Exponential functions can describe unrestrained population growth, such as that of rabbits if they have no natural enemies. Logistic functions start out like exponential functions but then level off. Logistic functions can model restrained population growth where there is a maximum sustainable population in a certain region.